

MECHANICAL ABBREVIATIONS			
AD	AREA DRAIN	INSUL	INSULATION
A.F.F.	ABOVE FINISHED FLOOR	INV	INVERT
AFMS	AIR FLOW MEASURING STATION	KW	KILOWATT
AHU	AIR HANDLING UNIT	LAT	LEAVING AIR TEMPERATURE
ANB	ACID NEUTRALIZING BASIN	LAV	LAVATORY
AP	ACCESS PANEL	LWT	LEAVING WATER TEMPERATURE
ARCH	ARCHITECT	MBH	BTU PER HOUR (THOUSANDS)
AS	AIR SEPARATOR	MCF	THOUSAND CUBIC FEET
BD	BUTTERFLY DAMPER	MH	MANHOLE
B/G	BELOW GRADE	NC	NOISE CRITERIA OR NORMALLY CLOSED
BTU	BRITISH THERMAL UNIT	NEG	NEGATIVE
BWV	BACKWATER VALVE	NIC	NOT IN CONTRACT
CCF	HUNDRED CUBIC FEET	NO	NORMALLY OPEN
CFH	CUBIC FEET PER HOUR	NTS	NOT TO SCALE
CFM	CUBIC FEET PER MINUTE	OA	OUTSIDE AIR
CL	CENTER LINE	OBD	OPPOSED BLADE DAMPER
CLG	CEILING	ORD	OVERFLOW ROOF DRAIN
CO	CLEAN OUT	PD	PRESSURE DROP OR DIFFERENCE
CONTR	CONTRACTOR	PE	PNEUMATIC-ELECTRIC
CONV	CONVECTOR	PLBG	PLUMBING
CUH	CABINET UNIT HEATER	PRV	PRESSURE REDUCING VALVE OR POWER ROOF VENTILATOR
OW	COLD WATER	PSIA	POUNDS/SQ INCH ABSOLUTE
DB	DECIBEL	PSIG	POUNDS/SQ INCH GAUGE
DF	DRINKING FOUNTAIN	PVC	POLY VINYL CHLORIDE
DIA	DIAMETER	RA	RETURN AIR
DIFF	DIFUSER	RCP	REINFORCED CONCRETE PIPE
DISCH	DISCHARGE	RD	ROOF DRAIN
DMPR	DAMPER	RECIRC	RECIRCULATING
DN	DOWN	REG	REGISTER
DR	DRAIN	RET	RETURN
DS	DOWNSPOUT	RH	RELATIVE HUMIDITY
DWG	DRAWING	RHT	REHEAT
EAT	ENTERING AIR TEMPERATURE	RHC	REHEAT COIL
EDR	EQUIVALENT DIRECT RADIATION	RHW	RECIRCULATED HOT WATER
EP	ELECTRIC-PNEUMATIC	RM	ROOM
EW	ELECTRIC WATER COOLER	RPM	REVOLUTIONS PER MINUTE
EWT	ENTERING WATER TEMPERATURE	RPZ	REDUCED ZONE BACKFLOW PREVENTER
EXH	EXHAUST	SA	SUPPLY
EXP	EXPANSION	SAN	SANITARY
F	FAHRENHEIT	SCFM	CFM, STANDARD CONDITIONS
FC	FAN COIL	SD	SMOKE DAMPER
FCO	FLOOR CLEAN OUT	SP	STATIC PRESSURE
FD	FLOOR DRAIN	SPECS	SPECIFICATIONS
FHC	FIRE HOSE CABINET	SUP	SUPPLY
FHR	FIRE HOSE RACK	SO	SQUARE
FLR	FLOOR	STM	STEAM
FLEX	FLEXIBLE	TD	TEMPERATURE DIFFERENCE
FM	FIRE MAIN	TEMP	TEMPERATURE
FPM	FEET PER MINUTE	TONS	TONS OF REFRIGERATION
FPS	FEET PER SECOND	T-STAT	THERMOSTAT
FT	FEET OR FOOT	TYP	TYPICAL
F&T	FLOAT AND THERMOSTATIC	UB	UP-BLAST
FTG	FOOTING	UF	UNDERFLOOR
FTR	FINNED TUBE RADIATION	UG	UNDERGROUND
FV	FACE VELOCITY	UH	UNIT HEATER
GA	GAUGE	UR	URINAL
GAL	GALLON	V	SANITARY VENT
GPH	GALLONS PER HOUR	VAV	VARIABLE AIR VOLUME
GPM	GALLONS PER MINUTE	VD	VOLUME DAMPER
GR	GRILLE	VEL	VELOCITY
HB	HOSE BIBB	VFD	VARIABLE FREQUENCY DRIVE
HD	HEAD	VOL	VOLUME
HOA	HANDS-OFF-AUTOMATIC	W	SANITARY WASTE
HTG	HEATING	W/	WITH
HTR	HEATER	W/O	WITHOUT
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING	WC	WATER CLOSET
HYD	HYDRANT	WCO	WALL CLEANOUT
HW	HOT WATER	WH	WALL HYDRANT
GCO	GRADE CLEANOUT	WTR	WATER

PLUMBING		PLUMBING /PIPING		DUCTWORK	
AV	ACID VENT BELOW GRADE	ELBOW DOWN		SUPPLY AIR	
AV	ACID VENT ABOVE GRADE	PIPE CAP		RETURN AIR	
AW	ACID WASTE BELOW GRADE	ELBOW UP		EXHAUST AIR	
AW	ACID WASTE ABOVE GRADE	TEE, OUTLET UP			
DI	DEIONIZED WATER	TEE, OUTLET DOWN			
	DOMESTIC COLD WATER	CONNECTION, BOTTOM			
	DOMESTIC HOT WATER				
140	DOMESTIC HOT WATER (TEMP. INDICATED)	CONNECTION, TOP			
	DOMESTIC RECIRC. HOT WATER				
HARD	HARD COLD WATER	ECCENTRIC REDUCER			
OSD	OVERFLOW STORM DRAIN BELOW GRADE	CONCENTRIC REDUCER			
OSD	OVERFLOW STORM DRAIN ABOVE GRADE	FLEXIBLE CONNECTION			
RO	REVERSE OSMOSIS WATER	EXPANSION JOINT			
V	SANITARY VENT BELOW GRADE	PIPE ANCHOR			
V	SANITARY VENT ABOVE GRADE	ALIGNMENT GUIDE			
W	SANITARY WASTE	CHECK VALVE			
SS	SANITARY SEWER	SHUTOFF VALVE			
SDT	SOIL DRAINAGE TILE	PLUG VALVE			
SOFT	SOFTENED COLD WATER (SCW)	COMBINATION BALANCE VALVE AND FLOW METER			
SHW	SOFTENED HOT WATER				
TW	TEMPERED WATER	STRAINER			
SD	STORM DRAIN BELOW GRADE	STRAINER W/BLOWDOWN CAP AND VALVE			
SD	STORM DRAIN ABOVE GRADE				
WW	WELL WATER	PRESSURE REDUCING VALVE (SETTING AS NOTED, PSI)			
	EXISTING PLUMBING TO REMAIN	AUTOMATIC CONTROL VALVE, 2-WAY			
	EXISTING PLUMBING TO REMOVED				
		AUTOMATIC CONTROL VALVE, 3-WAY			
		AUTOMATIC AIR VENT			
		MANUAL AIR VENT			
		PRESSURE RELIEF/SAFETY VALVES (SETTING AS NOTED, PSI)			
		DRAIN VALVE			
		BALL VALVE			
		BUTTERFLY VALVE			
		DIAPHRAGM			
		GLOBE ANGLE VALVE			
		0. S & Y. VALVE			
		REDUCED PRESSURE ZONE BACK FLOW PREVENTER			
		SOLENOID VALVE			
		FLOW LIMITING VALVE			
		REFRIGERANT SIGHT GLASS			
		GLOBE VALVE			
		GAS PRESSURE REGULATOR VALVE			
		BACKWATER VALVE			
		REFRIGERANT DRYER			
		FLOW DIRECTION			
		FLOW DIRECTION SWITCH			
		DUPLEX STRAINER			
		PIPE UNION			
		PIPE FLANGE			
		PUMP			
		PRESSURE GAUGE W/PIGTAIL & PETCOCK			
		THERMOMETER			
		PRESSURE/TEMPERATURE TEST PORT			
		STEAM TRAP (TYPE INDICATED)			
		DIFFERENTIAL PRESSURE SENSOR			
		FLOW MEASURING STATION (FLOW INDICATED)			
		FLOW SWITCH			
		PRESSURE SWITCH			
		SHOCK ABSORBER			
		GAS COCK VALVE			
		ELBOW			
		TEE			
		FLOOR DRAIN			
		FLOOR SINK			
		WALL HYDRANT			
		HOSE BIBB			
		CLEANOUT			
		WALL CLEANOUT			
		ROOF DRAIN			
		DRAIN ABOVE			
		CATCH BASIN			
		MANHOLE			

MECHANICAL PIPING	
BF	BOILER FEED
CWS	CHILLED WATER SUPPLY
CWR	CHILLED WATER RETURN
100A	COMPRESSED AIR (PSI INDICATED)
CD	CONDENSATE DRAIN
CS	CONDENSER WATER SUPPLY
CR	CONDENSER WATER RETURN
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
FOV	FUEL OIL VENT
FOF	FUEL OIL FILL
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
HRS	HEAT RECOVERY SUPPLY
HRR	HEAT RECOVERY RETURN
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
LV	LABORATORY VACUUM
LA	LABORATORY AIR
LPG	LIQUIFIED PETROLEUM GAS
20G	NATURAL GAS (PSI INDICATED)
PV	PLANT VACUUM
PC	PUMPED CONDENSATE
RADS	RADIATION WATER SUPPLY
RADR	RADIATION WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCION
RHG	REFRIGERANT HOT GAS BYPASS
RHS	REHEAT WATER SUPPLY
RHR	REHEAT WATER RETURN
RRS	REMOTE RADIATOR SUPPLY
RRR	REMOTE RADIATOR RETURN
SHWS	SECONDARY HEATING WATER SUPPLY
SHWR	SECONDARY HEATING WATER RETURN
SMS	SNOW MELT SUPPLY
SMR	SNOW MELT RETURN
SWS	SOURCE WATER SUPPLY
SWR	SOURCE WATER RETURN
100STM	STEAM SUPPLY (PSI INDICATED)
100R	STEAM RETURN (PSI INDICATED)
LPC	LOW PRESSURE CONDESATE
HPC	HIGH PRESSURE CONDESATE

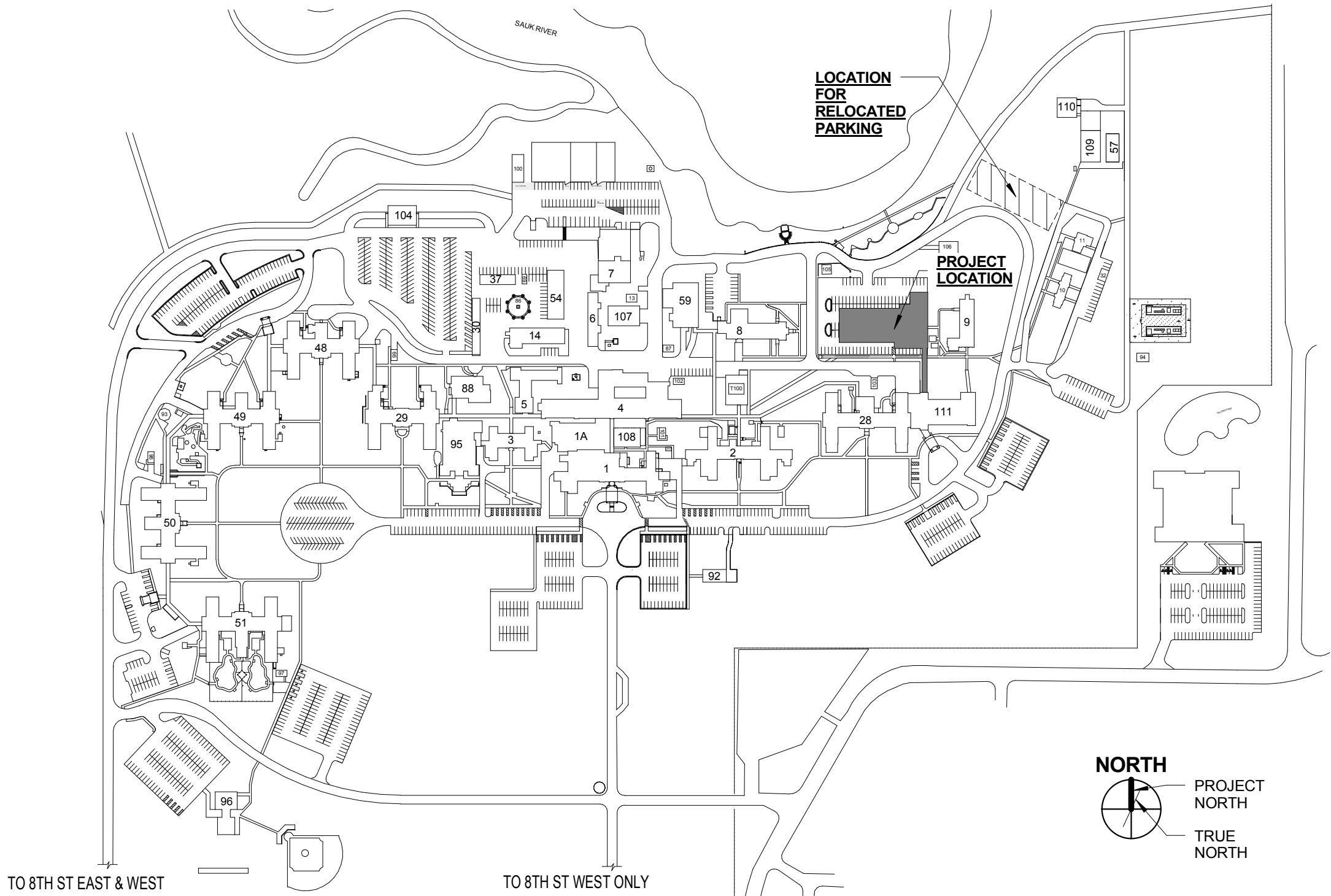
FIRE PROTECTION	
F	FIRE PROTECTION
DFF	FIRE PROTECTION (DRY SYSTEM)
	POST INDICATOR VALVE (PIV)
(FDVC)	FIRE HYDRANT WITH SHUTOFF VALVE
(FDVC)	RECESSED FIRE DEPT CABINET
(FDVC)	SURFACE MOUNTED FIRE DEPT CABINET
	FIRE PROTECTION RISER
	UPRIGHT SPRINKLER HEAD W/GUARD
	PENDANT SPRINKLER HEAD
	UPRIGHT SPRINKLER HEAD
	SIDEWALL SPRINKLER HEAD
TS	BUTTERFLY VALVE W/TAMPER SWITCH
TS	DETECTOR CHECK W/BYPASS METER
	GRADE FIRE DEPT CONNECTION
	FLUSH FIRE DEPT CONNECTION
FDV	FIRE DEPT VALVE W/CAP AND CHAIN
TS	O.S. & Y. VALVE W/TAMPER SWITCH
	DRY PIPE VALVE
	PREACTION VALVE

ANNOTATION	
QUANTITY	GRILLE, REGISTER, & DIFFUSER IDENTIFICATION
TYPE	
SIZE	
CFM	
	DETAIL NUMBER
	SHEET NUMBER
	SECTION NUMBER
	SHEET NUMBER
	EQUIP DESIGNATION
	EQUIP NUMBER
	POINT OF CONNECTION, NEW TO EXISTING
	POINT OF DISCONNECTION

CONTROLS	
T	AQUA STAT
1	TAMPERPROOF THERMOSTAT
1	HUMIDISTAT OR R.H. SENSOR
2	REFRIGERANT SENSOR
3	SMOKE DETECTOR
4	ROOM PRESSURE MONITOR
5	SPACE TEMPERATURE SENSOR
6	THERMOSTAT W/GUARD
7	TEMPERATURE SENSOR
8	THERMOSTAT

GENERAL NOTES	
A.	INSTALL VOLUME DAMPER IN DUCT TAKE-OFF TO EACH DIFFUSER, GRILLE AND REGISTER.
B.	ALL DUCT DIMENSIONS ARE CLEAR INSIDE DIMENSIONS.
C.	IN GENERAL, ALL PIPING AND DUCTWORK SHALL BE RUN CONCEALED IN SUSPENDED CEILING SPACES AND IN SHAFTS PROVIDED UNLESS NOTED OR INDICATED OTHERWISE.
D.	MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL SLEEVES AND/OR OPENINGS WHERE REQUIRED TO RUN PIPES AND DUCTS THROUGH FOUNDATIONS, FLOOR SLABS, WALLS, BRIDGING AND BEAMS, EXCEPT WHERE OTHERWISE INDICATED. PENETRATION SEALANT RATING TO MATCH STRUCTURE RATING.
E.	VERIFY ALL DUCT CONNECTION SIZES TO FANS AND COILS.
F.	COOPERATE WITH THE OTHER TRADES TO ELIMINATE ANY CONFLICTS BETWEEN PIPING, DUCTWORK, STRUCTURAL, ELECTRICAL WORK, ETC.
G.	DIFUSER, REGISTER, AND SPRINKLER HEAD LOCATIONS SHALL BE COORDINATED WITH LIGHT FIXTURE LOCATIONS AND SHALL BE IN ACCORDANCE WITH CEILING PATTERNS AS SHOWN ON ARCHITECTURAL REFLECTED CEILING PLANS.
H.	ALL SQUARE DIFFUSERS SHALL HAVE THE AIR FLOW DISTRIBUTED EQUALLY IN FOUR DIRECTIONS UNLESS INDICATED OTHERWISE.
I.	MECHANICAL CONTRACTOR TO VERIFY RATINGS OF ALL WALLS WITH ARCHITECTURAL DRAWINGS AND SEAL PIPE PENETRATIONS TO MATCH THE WALL RATINGS.
J.	VERIFY ALL EXISTING DUCT CONNECTION SIZES.
K.	MECHANICAL CONTRACTOR TO PROVIDE COORDINATION PLANS FOR HVAC, DIFFUSER, REGISTER, FIRE PROTECTION, ETC. ALL WORK SHALL BE IN ACCORDANCE WITH CEILING PATTERNS AS SHOWN ON ARCHITECTURAL REFLECTED CEILING PLANS.
L.	UNLESS NOTED OTHERWISE, RUNOUTS TO VAV BOXES SHALL BE THE SAME SIZE AS THE INLET TO THE BOX.
M.	UNLESS NOTED OTHERWISE, RUNOUTS TO DIFFUSERS SHALL BE THE SAME SIZE AS THE DIFFUSER'S NECK SIZE.
N.	PROVIDE ISOLATION VALVES ON BRANCH TAKE-OFFS FROM THE DOMESTIC WATER AND NATURAL GAS PIPING MAINS IF SHOWN ON DRAWING OR NOT.
P.	THERE ARE TO BE NO FIRE DAMPERS IN GREASE DUCTS.

DRAWINGS		ISSUES			
ISSUE KEY:		70% CD REVIEW - 02/11/2011	85% CD REVIEW - 03/24/2011	100% OWNER REVIEW - 11/17/11	100% OWNER REVIEW - 12/16/11
1	ISSUED (WITH SIGNATURE)				
2	REVISED AND RE-ISSUED (WITH SIGNATURE)				
3	NOT FOR CONSTRUCTION - REFERENCE ONLY				
4	REISSUED FROM PRIOR BID PACK - NO REVISIONS				
SHEET NO	NAME				
M000	MECHANICAL TITLE SHEET	3	3	3	3
M100	CRAWLSPACE HVAC & PIPING PLAN		3	3	3
M101	GROUND FLOOR HVAC PLAN		3	3	3
M102	GROUND FLOOR PIPING PLAN		3	3	3
M103	LINK HVAC AND PIPING PLANS		3	3	3
M104	ATTIC MECHANICAL PLAN		3	3	3
M105	BUILDING 59 DEMOLITION AND NEW PIPING PLANS			3	3
M106	BUILDING 8 PIPING PLAN			3	3
M107	SITE STEAM PLAN			3	3
M108	DEDUCT ALTERNATE 9 - MECHANICAL PLANS			3	3
M200	MECHANICAL ROOF PLAN		3	3	3
M300	ENLARGED MECHANICAL ROOM HVAC & PIPING PLANS		3	3	3
M301	MECHANICAL ROOM PERSPECTIVE VIEWS		3	3	3
M302	MECHANICAL FLOW DIAGRAM		3	3	3
M400	MECHANICAL DETAILS		3	3	3
M401	MECHANICAL DETAILS		3	3	3
M402	MECHANICAL DETAILS		3	3	3
M500	MECHANICAL SCHEDULES		3	3	3
M501	MECHANICAL SCHEDULES		3	3	3
M510	MECHANICAL/ELECTRICAL SCHEDULES		3	3	3
M511	MECHANICAL/ELECTRICAL SCHEDULES		3	3	3
M512	CONTROL SEQUENCES		3	3	3
M513	CONTROL SEQUENCE DIAGRAMS		3	3	3
P100	CRAWLSPACE PLUMBING PLAN		3	3	3
P101	GROUND FLOOR PLUMBING PLAN		3	3	3
P200	WASTE AND VENT RISER DIAGRAM		3	3	3
P201	DOMESTIC WATER RISER DIAGRAM		3	3	3
P200	ENLARGED MECHANICAL ROOM PLUMBING PLAN		3	3	3
P400	PLUMBING DETAILS		3	3	3
P500	PLUMBING/ELECTRICAL SCHEDULES		3	3	3



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**RSP Architects**  
1220 Marshall Street NE  
Minneapolis  
Minnesota 55413-1036  
612.677.7100  
612.677.7499 fax  
www.rsparch.com

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#### CONSULTANTS:

**Structural**  
Van Sickle, Allen & Assoc.  
2955 Xenium Lane N  
Suite 10  
Plymouth, MN 55441

**Civil**  
EVS  
10250 Valley View Road  
Suite 113  
Eden Prairie, MN 55344

**Landscape**  
Damon Farber Assoc.  
923 Nicollet Mall  
Suite 100  
Minneapolis, MN 55402

**Fire Protection**  
Gary Travinski Associates  
Engineering  
94 Boston Hill  
Larksville, PA 18851-3298

**MEP**  
**DUNHAM**  
Dunham Associates, Inc.  
60 South Park Street / Suite 1000  
Minneapolis, Minnesota 55402-1000  
phone 612.448.7000  
fax 612.448.7001  
www.dunham.com  
mechanical & electrical  
consulting engineering  
10000 HILL PARKWAY

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed Engineer under the laws of the State of Minnesota.

Signature

Registration No.

Date 11/17/2011

APPROVED: SERVICE LINE DIRECTOR	DATE	APPROVED: INFECTION CONTROL NURSE	DATE
APPROVED: CLINICAL COORDINATOR	DATE	APPROVED: PATIENT SAFETY	DATE
APPROVED: PROJECTS SECTION MANAGER	DATE	APPROVED: CHIEF OF POLICE	DATE
APPROVED: DIRECTOR FMS	DATE	APPROVED: SAFETY MANAGER	DATE

DRAWING TITLE		MECHANICAL TITLE SHEET	
PROJECT TITLE	LONG TERM / INTERMEDIATE PSYCHIATRIC UNIT	BUILDING NO	100
PROJECT NO	2032.001.00	CHECKED BY	DM
DATE	12/16/2011	DESIGNED BY	TNHHB
LOCATION	4801 VETERANS DR. SAINT CLOUD, MN	DATE	12/16/2011

